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U.S. ARMY COMMAND AND GENERAL STAFF COLLEGE

TACTICAL NUCLEAR OPERATIONS: THE DOCTRINAL DILEMMA

By

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A RESEARCH STUDY SUBMITTED TO THE AIR FORCE FACULTY

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ABSTRACT

The situation surrounding tactical nuclear weapons use is one affected by a great number of vital factors. The most basic is the doctrinal foundation upon which all tactical nuclear operations are built. U.S. nuclear deterrent credibility rests on how effective that doctrine is in convincing the enemy of the will to employ it as viable strategy on the battlefield. This study discusses the basics of tactical nuclear operations--the balance in weapons systems, the author's deterrence analysis and his conclusions and recommendations. The final recommendation suggests a new "theater nuclear" doctrinal statement be established which is explicit, direct and above all, one which reflects the national will.

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EXECUTIVE SUMMARY

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TITLE: TACTICAL NUCLEAR OPERATIONS: THE DOCTRINAL DILEMMA

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I. Purpose: To present guidelines and recommendations to develop a new and more viable tactical nuclear doctrine.

II. Problem: The United States does not have a viable tactical nuclear doctrine. The lack of doctrine effects not only procuring new weapons systems and how to employ tactical nuclear weapons, but the will to use them as well. as the Soviet military becomes stronger, our deterrent capability decreases. There is more to the doctrinal problem than just having weapons available in theater.

III. Data: Current analyses by several sources indicate a relative balance in available tactical and theater nuclear weapons systems. Totals for both sides now indicate approximately 14,000 warheads are available for use. Soviet military growth in past years has indicated not a defensive posture, but a totally offensive posture of military superiority. With this military superiority, U.S. deterrence capability becomes fragile if positive steps to improve the basic aspects of U.S. tactical nuclear

capability are not taken. Improvements are needed in most areas of tactical nuclear warfare. The most basic improvement needed is in the doctrinal foundation.

IV. Conclusions: A firm, explicit U.S. tactical nuclear doctrine has not existed since tactical nuclear weapons were first deployed to Europe in the mid 1950s. Any chance to recover from this lack of doctrine was paralyzed in 1961 when emphasis quickly changed from tactical nuclear operations/weapons to conventional operations. This lack of emphasis promoted a lack of confidence, and reduced funding, training and expertise. These problems grew to a psychological aversion to using tactical nuclear weapons. With this aversion or mindset, U.S. nuclear superiority eroded to a less than parity situation, further reinforcing the aversion to nuclear use. This aversion is significant because it effects the total time it takes to secure nuclear weapons release.

Other factors effecting U.S. doctrinal/deterrent credibility are the age of the warheads and vulnerability of nuclear stockpiles and communications systems which U.S. forces rely on to secure nuclear release authority.

V. Recommendations: The U.S. should 1) undertake a major program to develop a firm, explicit and well-defined theater nuclear doctrine which includes the use of tactical nuclear weapons; 2) correct major deficiencies in the nuclear stockpile vulnerability, communications survivability, training and official publication inadequacies; 3) undertake a major educational program to change the psychological aversion to nuclear weapons use.

CHAPTER I

INTRODUCTION

Setting the Stage

At 2310 hours Eastern Standard Time, 15 April 19____, the President of the United States is informed Soviet and Warsaw Pact forces have, without warning or provocation, attacked numerous North Atlantic Treaty Organization (NATO) airfields and installations in the Federal Republic of Germany (FRG) and the Benelux countries partially crippling NATO ability to launch defensive fighter efforts. Additionally, intelligence reports a minimum of 54 Soviet and Warsaw Pact divisions, consisting of motorized rifle and tank forces, have attacked on three fronts across the East German-FRG border and are now attacking strategic locations in the FRG. Reports indicate little resistance because of malpositioned NATO forces. NATO forces are now beginning to mobilize and move to defensive positions, but confusion over the situation is preventing quick response. Extreme Soviet electronic warfare has disrupted command, control and communications efforts. Casualties are reported moderate to heavy at some airfields where it appears Soviets delivered chemical weapons by missiles. Intelligence estimates are bleak. It appears the overwhelming Soviet-Warsaw Pact forces could be in Frankfurt within 48 hours if immediate action is not taken. The President orders immediate

general mobilization and calls on the National Security Council to meet within 30 minutes to develop suitable courses of action. Although this is a hypothetical situation it could very well happen tomorrow.

After World War II was over, the United States quickly began "dismantling" her armed forces. Dropping two atomic bombs left little doubt in anyone's mind that the United States meant to end the war quickly and decisively. Since the U.S. had a monopoly on atomic weaponry, no nation dared challenge her might or resolve. But this monopoly was short-lived when the Soviets tested their first nuclear device in September, 1949. Since then, the Soviets have persisted in increasing their nuclear capability from the once inferior position to nuclear parity, to nuclear parity plus, while the U.S. in the mid-1960s essentially froze its nuclear force levels.

What options are available which can stop an overwhelming force such as described? What are the Presidential courses of action? One such course of action available when faced with insurmountable odds is to use tactical nuclear weapons to blunt the attack and cause the aggressor to think twice about continuing the attack. In essence, there would be a return to the "status quo" situation. But who will authorize the use of tactical nuclear weapons? Under what circumstance? How long will it take to get release authority? How will they be employed once nuclear release authority is given? These are some of the questions being asked by politicians, diplomats, defense officials, NATO

officials and the professional soldier. The questions are not new. They've been asked for over three decades, yet we still have not been able to answer them adequately.

In the above hypothetical situation, the President is essentially faced with an ultimatum--either use tactical nuclear weapons to stop any further enemy advance or Western Europe could become Soviet territory in a matter of days. Will the President authorize nuclear weapons use? Former Secretary of Defense, James R. Schlesinger has stated ". . . we must recognize in our planning that the decision to initiate the use of nuclear weapons--however small, clean, and precisely used they might be--would be the most agonizing that could face any national leader."¹ Not only have top national authorities displayed a reluctant attitude, President Carter stated in 1977:

The decision to use nuclear weapons of any kind, including ER weapons, would remain in my hands, not in the hands of local theater commanders. A decision to cross the nuclear threshold would be the most agonizing decision to be made by any President. I can assure you that these weapons, i.e., low yield, enhanced radiation weapons would not make that decision easier.²

These statements, among others dealing with the use of nuclear weapons, lead one to believe there is a definite reluctance, if not aversion, to using nuclear weapons, whether they are strategic or tactical. Has this psychological aversion to their use undermined our deterrent capability? Certainly it will have, or must have, some effect on the future decisions of our potential adversaries.

Purpose

So where is the U.S. headed in the realm of tactical nuclear warfare (TNW)? Is U.S. TNW policy and doctrine explicit and sound enough to deter a situation, as outlined above, from happening? What is U.S. TNW policy and doctrine? These are the questions addressed in this paper. The objective is to relate a rather precarious and belittled subject to those who have little knowledge in the area of TNW. But in doing so, to sufficiently address certain basic fundamentals of U.S. and Soviet military policy and doctrine which, up to now, appear to have been glossed over. Soviet nuclear policy and doctrine appear to be resting on solid ground while U.S. policy and doctrine (what little there is) seem to be sinking quickly. While one could examine the complete realm of Soviet nuclear doctrine as a study in itself, it may be of significant value to examine and possibly learn a lesson in strongly advocating tactical nuclear doctrine.

Certain aspects of international relations are certainly relevant at this point. The U.S. international (and national) attitude at a crucial time of decision may well prove the decisive factor in nuclear warfare. What are the historical factors affecting U.S. international political decisiveness? Two relevant factors are: status quo vice revisionist attitude, and idealist vice realist impact on foreign policy. The United States has many times been noted as a "status quo" vice a "revisionist" state in the international world. These two categories differ sharply in overall objectives. Status quo states are "those nations largely

satisfied with their respective roles and places in the existing international order, and therefore interested in preserving it"³ Conversely, the revisionist states are "those intent on effecting fundamental changes in the prevailing distribution of power and advantages"⁴ Basic to the status quo theory are: recognizing conflict as an inherent characteristic in the international realm and abhoring the thought of initiating it. Even after becoming involved in conflict, the status quo nation will do everything in its power to prevent escalation and work to resolve the conflict at the lowest level of tension possible.⁵ A prime example of this label as a status quo nation is the events surrounding the blatant attack by Iranian students on the U.S. Embassy in Iran and the subsequent hostage situation. President Carter has stated on numerous occasions the U.S. will attempt to effect the hostage's release through every possible diplomatic and international channel prior to exercising "other" options. David P. Calleo, in his article "The European Coalition In A Fragmenting World," points out "the United States has gradually moved toward a general understanding with the Soviet Union. The basis of that understanding has already been a mutual acceptance of the status quo, in particular the European status quo."⁶

U.S. history may have some psychological influence on the individual making the decision to initiate tactical nuclear weapons use. This psychological influence may come in the form of idealism or realism, two very significant "isms" in the international setting. Clem and Falk indicate idealism has had an

important impact on shaping U.S. foreign policy. Two areas are most vivid: "(1) the traditional American attitude toward power and international conflict, and (2) America's insistence on adherence to ethical principle and legality in their relations with other nations."⁷ Hence, we note the obsession with consummating endless treaties and agreements and undertaking, at times, fruitless debates within the United Nations' Security Council, only to have the debate end with a firm and resounding veto from the Soviet Union.

With intrepid American precedent, international actions, customs and practice staring him in the face, what action will the President now take in the face of ultimate Soviet control of Western Europe? Is Western Europe still as important to the defense of the United States as it was 30 minutes ago? Does he shatter all precedent and order the immediate release and subsequent use of tactical nuclear weapons in an attempt to terminate hostilities immediately? These, too, are questions which the President, one day, may well have to answer.

United States tactical nuclear doctrine, at best, is a fragmented and muddled subject most people would rather avoid. The reason for this is, perhaps, because there are so many problem areas associated with TNW. To broach the subject of doctrine, one must examine a multitude of areas.

Why does U.S. tactical nuclear doctrine and policy appear unsound? Simply because the U.S. does not concentrate efforts on TNW. In the nuclear realm, U.S. focus is primarily on strategic

nuclear use. Van Cleave and Cohen, in examining TNW, point out: "the FY 1977 Department of Defense report . . . reflected only a vague and muddled employment concept--far from being doctrine--and was again explicit about an overriding reluctance to use the weapons or to base a defensive deterrent posture on them."⁸

Another author states the "TNW inventory represents a sizeable amount of firepower for which the United States has at best a minimal employment policy and a very general deployment doctrine."⁹

Van Cleave and Cohen also make the strong point:

On the tactical side of the ledger, however, no comparable attention has been given to the survivability of U.S. nuclear weapons deployed outside the country, and little of real significance has been done to reduce their vulnerability to attack. This is particularly true with respect to surprise attacks. This continued reluctance has led to a situation in NATO where U.S. tactical nuclear policy is now at odds with itself. Whereas, on one hand, this policy holds that the fundamental role for tactical nuclear weapons in Europe is to deter nuclear attack on NATO, on the other hand, the high vulnerability of these weapons gives scant comfort that this alleged deterrent is at all credible; and, in fact, it can be argued--as one well-known pundit pointed out a decade ago--that this vulnerability gives every incentive to the Soviets to attack these forces with nuclear weapons . . .¹⁰

Commenting further on tactical nuclear doctrine, Van Cleave and Cohen state:

. . . it may be more appropriate to describe the controlling factors for NATO's possible use of tactical nuclear weapons as much more a nebulous agreement to deal with an undefined contingency than a strategy or doctrine for use . . .

The United States and NATO do not have what appropriately can be called a doctrine for tactical nuclear weapons and forces; nor in the current framework and climate is there likely to be one. Rather than spelling out terms of use, the current guidelines are basically concerned with conditions enabling (or preventing) a decision for use with

the military aspects of the problem almost submerged by the overriding procedural and political factors.¹¹

Where are we going? Examining policy and doctrine should certainly give some insight to an answer. Yet much more must be dealt with to adequately determine an answer. By adhering to the basics of the issue, this author plans to build on existing concepts and issue some guidelines to use in developing a firm, cohesive and lasting doctrine for TNW--one which the U.S. can rest assured will deter possible Soviet or other aggression.

This study will examine several important tenets--all basic to the study of TNW doctrine. First, I will discuss the present U.S. TNW capability, limitations and strengths. Second, how did the U.S. get to where they are--an evolution of existing TNW doctrine? Third, what is the threat? What is the Soviet capability and stated doctrine to wage a tactical nuclear war in Europe? Fourth, how does the U.S. measure up to the Soviet threat considering the effectiveness of their deterrent capability? And last, I'll present study conclusions and recommendations on how the U.S. can overcome its present weaknesses, and what actions the U.S. can take to improve the doctrinal picture as it now exists. In this portion of the paper, a firm doctrinal statement will be presented as a solid foundation for U.S. theater nuclear doctrine.

CHAPTER II

ANALYSIS OF UNITED STATES/NATO TACTICAL NUCLEAR CAPABILITY

Assumptions

Before discussing U.S./NATO tactical nuclear capability a brief note on three areas should be discussed and assumptions outlined. These areas include relative equivalence, tactical versus strategic weapons and nuclear weapons of other NATO countries.

I dislike "bean-counting" when comparing weapons systems and their capabilities. Yet it appears this unsophisticated way of establishing a logical start point may be the only way to determine relative equivalence when speaking of nuclear weapons systems. Sheer numbers of nuclear weapons systems do not necessarily establish a clear cut advantage for one side or another (if one even needs to be established). Other aspects such as yield and accuracy of the warhead, logistical problems and range also play major roles in the relative equivalence of weapons systems. But it is quite obvious numbers alone play a major role in deterring aggression in this day and age.

Second, there must be a limit or bounds placed on this bean count. The question arises, what is considered a tactical weapon and what is considered strategic? This is not an easy question to answer for many of the nuclear weapons within NATO can be

classified as both. A good example of this dichotomy is the new Pershing II missile with its improved range (1,800 to 2,400 kilometers), or the ground-launched cruise missile (GLCM), or air-launched cruise missile (ALCM). Each of these weapons could be used in a battlefield (tactical) situation or in a strategic strike within the Soviet Union. For the purposes of this chapter, I have chosen to address all nuclear weapons considered to be theater nuclear weapons except sea-launched ballistic missiles (SLBMs). This includes weapons with the capability to be used in both a tactical and a strategic situation.

Finally, since other NATO nations would be involved in a European war, I must assume nuclear weapons from other European nuclear powers would or could be used. Weapons located in the United Kingdom and France may have a major impact on the outcome of a war. However, a detailed discussion of weapons controlled by other NATO nations is not within the scope of this study.

With these thoughts in mind, let's examine the present levels of nuclear forces/weapons which could be used if a tactical nuclear European war occurred.

General Information

The United States has approximately 7,000 tactical nuclear warheads in the European theater. However, this number can probably be reduced somewhat if you consider operational ready status of weapons and weapons systems. In a September 1977 article entitled "Enhanced Radiation Warfare," Jorma K. Miettinam gave

a low estimate of 7,000 tactical nuclear warheads and a high estimate of approximately 11,000 U.S. tactical nuclear warheads in Europe.¹²

Theater nuclear warheads include various types which can be loaded on multiple systems. Types of warheads include short and medium range ballistic missiles, artillery projectiles, tactical bombs and atomic demolition munitions (ADMs), surface-to-air missiles and depth bombs. All types could be used in a tactical or battlefield situation. Total numbers of warheads are not broken down by type weapons system. According to Van Cleave and Cohen, "Supreme Allied Commander, Europe (SACEUR) once referred to about 3000 tactical or battlefield weapons."¹³ This number refers only to tactical nuclear weapons and not theater nuclear weapons as used in this chapter. What is important here is to establish that there are more than enough weapons to accomplish a wartime mission in the European theater if given the necessity for use and the authority.

Artillery

The prime NATO artillery weapons systems in tactical nuclear operations are the 155 millimeter (mm) howitzer and the 203mm or "8-inch" gun. Both systems are dual capable, that is, they are designed for firing both conventional and nuclear weapons. Much debate has focused on this single point of "dual capable" weapons systems. Authors of a recent study on integrated nuclear/non-nuclear battlefield operations point out as one of the principle elements of an integrated tactical nuclear concept is "dual

capable systems are essential for the continuous target planning and attack required for integrated nuclear/non-nuclear operations."¹⁴ According to the study, "tactical nuclear weapons systems can best support integrated nuclear/non-nuclear operations" if dual capable.¹⁵ Using the same delivery systems for both operations allows a greater ease in training, fire planning and operations. Further, the delays when transitioning from non-nuclear to nuclear operations would be minimal. But several authors have disputed the dual capable systems as not supporting a specific doctrine. Van Cleave and Cohen state unequivocably "dual-capable systems are very seldom optimal for either a tactical nuclear or a conventional role, leaving aside planning and operational difficulties of changing from one to the other."¹⁶ From the arguments espoused on both sides, it appears the U.S. Army Field Artillery School is developing or has developed training programs which will alleviate the problems in operating dual capable artillery systems.

The weapons systems deployed are many and sources conflict on figures reflecting total strengths. Most NATO nations include them in their weapons inventories. The 155mm howitzer is either mounted on an M-109 tracked vehicle or it can be towed. The U.S. first deployed the 155mm howitzer in 1964. The range of the system varies depending on the type ammunition employed, but generally ranges from 14 to 24 kilometers¹⁷ while warhead yields also vary but are generally given as up to 2 kilotons.¹⁸ (See Table I.)

The Army recognizes the 203mm or "8-inch" howitzer as the "workhorse" of the field artillery. The Army first employed this system during World War I and it has proven an exceptional weapon.¹⁹ Since then, it has been modernized several times. The current 8-inch gun, deployed in 1962, is mounted on an M110 self-propelled (SP) or M110A1 (SP) vehicle for mobility. As of August 1979, the U.S. Army had approximately 215 self-propelled systems in use. The range of the M110 (SP) is 16,800 meters while the M110A1 (SP) range is 20,600 meters. The 8-inch warhead is given in the low-kiloton range. U.S. Army field battalions are equipped with 18 guns. (See Table I.)

The Defense Department has two funded programs underway to modernize the artillery projectiles. The first is a program developing a new 8-inch artillery round, the XM753. This program is currently in production and incorporates advanced nuclear technology, improved accuracy and range. "The new 8-inch round will be able to incorporate with shortened lead time an Enhanced Radiation (ER) warhead if the President approves production of Enhanced Radiation weapons."²⁰ Second, a program developing a new 155mm artillery round is also underway which will improve the range and accuracy of this system. This program is in an early developmental stage.

The artillery projectile modernization programs underway are sorely needed. Most nuclear artillery rounds in the nuclear stockpile in Europe were deployed in the mid to late 1950s and early 1960s. Since the warheads are extremely old, this is a

significant limitation. Many have pointed out the "old" warheads are a significant safety hazard, to say nothing of their reliability, if the U.S. ever had to use them in a nuclear war. Edgar Ulsamer, Senior Editor for Air Force Magazine, has stated:

Stored nuclear warheads, called the nuclear stockpile, are subject to physical deterioration of the chemical explosives used to trigger them. While the expected stockpile life of nuclear weapons should be between fifteen and twenty-five years, he [Dr. Donald M. Kerr, the Department of Energy's Deputy Assistant Secretary of Defense Programs] said, "some designs have required corrective measures much sooner." There is "evidence of corrosion and other deterioration" in some currently stockpiled weapons. While in the past it often has been possible to make "fixes" without nuclear testing, in some instances actual testing was required, Dr. Kerr said. "A single such test could mean the difference between returning a weapon to the stockpile with perhaps a minimal fix, and remanufacturing all such weapons over a span of four to eight years, during which time a portion of our nuclear deterrent may be questionable."²¹

Dr. Kerr's statements lead one to believe all is not well with our nuclear stockpile, let alone its overall deterrent capability. More will be said about this subject in Chapter V of this study. Suffice to say now, until modernization of nuclear rounds for artillery weapons is complete, it poses as a major limitation to our tactical nuclear capability in Western Europe.

Missiles

Although the U.S. Army classifies their missile forces as artillery, breaking them out as a complete and separate entity appears logical. Employing missiles appears to be completely different since the weapons systems and ranges are significantly different from employed howitzer weapons systems.

The oldest system deployed within NATO is the Honest John missile having an initial operational capability of 1953. Its maximum range is approximately 25 nautical miles. There have been no major improvements made to this weapon. The warhead yield is approximately 25 kilotons. This weapons system has been phased out of the U.S. inventory but several systems remain in Allied units. (See Table I.)

The latest tactical missile system deployed in NATO is the Lance missile deployed in 1972. Presently, there are 8 Lance surface-to-surface missile battalions deployed in Europe.²² The range is approximately 5 miles minimum (8,000 meters) to a maximum of 70 miles with a yield in the low kiloton range. However, some sources place yields at up to 100 kilotons. (See Table I.)

This system is operated on the "shoot and skoot" basis. After the missile is launched, the vehicle is moved to a new position and readied for firing again. To fire the missile requires approximately 20 minutes preparation time to establish launcher position and missile gyro settings. "Grid reference of the target and of the firing position are fed into a standard FACE computer in the command FV 432 vehicle, and calculates the range, a figure proportional to the cut-off velocity required to hit the target."²³ The Lance is equipped with an inertial guidance system which makes it more accurate than any previous tactical missile system. The Department of Defense (DOD) now has conventional warheads under development. DOD also considered this system as the prime vehicle for delivering the enhanced radiation warhead.

The deployment of LANCE, a short range, surface-to-surface ballistic missile is completed except for the production of approximately 340 warheads, which will be produced during FY 1980-82. These warheads will offer the option for inclusion of an enhanced radiation feature, should the President later decide to add such a capability.²⁴

Another theater missile system considered by many to be a long-range system because of its 450 mile range is the Pershing missile. This system was first deployed in 1962. There are 180 systems deployed with 72 FRG and 108 U.S. launchers. This dual capable system can deliver a high yield (60 to 400 kiloton) warhead. With an inertial guidance system, its circular error of probability (CEP) is less than 400 meters at maximum range.²⁵ Since 1965, the Pershing units in the FRG have been assigned a Quick Reaction Alert (QRA) mission and are targeted against specific Warsaw Pact, high priority, time sensitive targets. According to F. Clifton Berry, Jr., "One battery in each battalion is on full alert at all times, in 'ready-to-fire' status at a field location. Each year at least 12 Pershing Ia missiles are fired by units from Germany."²⁶ A major limitation to the Pershing system is the time required to prepare for launch. The missile must be dismounted from the M757 transporter to be readied for launch requiring approximately two hours. This extended preparation time could be significant in a fast-paced European war. (Information about the Pershing II missile is in Chapter V.)

Atomic Demolition Munitions (ADMs)

The ADM is a purely defensive weapon. The weapon was conceived as a nuclear land mine designed to block or canalize

invading enemy forces by cratering or causing landslides in mountainous terrain. Additionally, they can be used to destroy bridges, roads or tunnels. By slowing the enemy or canalizing him, it provides lucrative targets or killzones for other weapons systems. Since it is basically a land mine, logically, it must be placed underground prior to detonation. This requires pre-chambering or "digging a special hole" to place the weapon in prior to use. This requires intricate planning, to say nothing of the timing involved in emplacing the weapon prior to enemy units traversing the area. According to one report

No chambers have been specifically constructed in Europe for ADM's, although there are chambers for conventional explosives. These chambers are not considered to be as satisfactory as chambers prepared specifically for ADM's some because they are shallower and would result in greater fallout.²⁷

The yields of the ADMs are generally in the sub-kiloton range.

There are presently studies underway to examine alternatives to the ADM in the form of earth penetrators delivered by missiles or aircraft. One such warhead is planned for the new Pershing II missile.

Aircraft

Probably the most potent, flexible and accurate of the tactical nuclear delivery systems is the aircraft. Nuclear capable, land-based aircraft include a great number of aircraft from most NATO nations. Among them are the British Vulcan B2 and Buccaneer; Mirage IVA, 5F and IIIE; British and French Jaguars; the F-104 flown by Belgium, FRG, Italy, Netherlands Norway and

Turkey; and the U.S. F-4, F-111E/F and FB-111A. The number of nuclear weapons carried varies depending on the aircraft. Approximately 1,100 warheads are assumed available for wartime use all of which range from sub-kiloton to over one megaton yields. Aircraft available for use generally is given as approximately 1,600 although this number would increase significantly after deploying U.S. based aircraft. There are presently 204 U.S. F-4C/D/E aircraft and 156 F-111E/F deployed in Europe.²⁸ (See Table I.)

The U.S. forces keep a small number of nuclear armed aircraft on QRA at all times. These aircraft are generally targeted against time sensitive Warsaw Pact targets. Targeting during actual hostilities can be on a pre-planned or target-of-opportunity basis.

Nuclear Weapons Release

The U.S. maintains positive control of all NATO nuclear warheads except those belonging to the United Kingdom and France. As President Carter has avidly stated on several occasions, nuclear weapons release will be given by him. A report to the U.S. Congress in 1975 states: "Under existing law, the President alone has the basic authority to order the use of nuclear weapons. This authority . . . may be delegated to subordinate officers in the chain of command virtually without limitation."²⁹ However, in the case of using nuclear weapons in Europe, the President must first confer with other NATO allies prior to their use when time and circumstance permit.

The sequence of requesting tactical nuclear release is not only time consuming, but could mean the difference between attaining U.S. military objectives after hostilities begin or being defeated. As portrayed graphically in U.S. Army Field Manual 100-5, Operations, this sequence could take as long as 24 hours.³⁰ The importance of this request sequence cannot be overstated. We often think of an enemy as being a stationary target when, in fact, he is actually moving. This is especially true with respect to the Soviets who base their whole offensive character on maintaining momentum--speed and mobility. If the U.S. takes a full 24 hours or even longer to secure nuclear release, the Soviets could well have obtained their primary and secondary strategic objectives. The question may then arise, is it even feasible to use nuclear weapons now considering the situation? The Soviets would have the U.S. exactly where they want them--questioning the use of nuclear weapons at all.

To be successful, nuclear weapons release must be responsive to the battlefield. The U.S. must quickly recognize the situation and know exactly the actions to take to quickly reverse an enemy offensive. To correct this situation, this author advocates a strong doctrinal base. (See Chapter VI.)

Conclusion

It is apparent through the above discussion, the United States has a formidable tactical nuclear capability. Apparent also is the fact that significant problem areas have developed. The age of weapons systems and warheads is of utmost concern.

Although some relief is in sight with the U.S. introducing the new 8-inch artillery projectile, the Pershing II and GLCM, these systems are two to three years into the future. With or without improvements, the successful use of nuclear weapons in battle will rely on timely nuclear release and above all, a solid doctrine on which to stand.

TABLE I. United States/NATO Tactical Nuclear Weapons Systems

<u>Weapons System Category and Type</u>	<u>Number Deployed</u>	<u>Max Range</u>	<u>Warheads, Yield</u>
Artillery:			
203mm (8-inch) Howitzer (M-110/M-110A1 SP)	215	20 km	Dual capable, 1, KT range
155mm Howitzer (M-109A1 SP)	300	24 km	Dual capable, 1, KT range
Missiles:			
Honest John	No U.S. systems	25 nm	1, 25 KT
Lance	36	70 nm	1, Low to high KT range
Pershing Ia	108 (U.S. only)	450 nm	1, 60 to 400 KT range
Other Munitions:			
Atomic Demolition Munitions	Unk	Local	Sub-kiloton

SOURCE: I.I.S.S., The Military Balance 1979-1980.

TABLE I (Continued). United States/NATO Tactical Nuclear Weapons Systems

<u>Weapons System Category and Type</u>	<u>Number Deployed</u>	<u>Max Range</u>	<u>Warheads, Yield</u>
Aircraft:			
F-4C/D/E	204	1400 nm	2, High KT range to 1 megaton
F-111E/F	156	2900 nm	3, High KT range to 1 megaton

SOURCE: I.I.S.S., The Military Balance
1979-1980.

CHAPTER III

EVOLUTION OF EXISTING UNITED STATES TNW DOCTRINE

General

There can be no mistaking the importance of the past 30 years in forging our existing strategic and tactical nuclear doctrine. The U.S. has evolved from the "first use" of nuclear weapons at the conclusion of World War II to a psychological aversion to even the idea of striking another country or military force with nuclear weapons. Why has there been this dramatic turnaround over the years? This chapter will discuss not so much a detailed evolution of doctrine, but rather reasons for this turnabout and the lack of a sound TNW doctrine.

Reasons for the Nuclear Retreat

First, as pointed out in Chapter I and discussed by Clem and Falk, the United States can be classified as a "status quo" nation--a nation set on maintaining the existing international order.³¹ Included in this status quo concept is the inherent U.S. philosophy of idealism. The U.S. bends over backwards to conduct international business in a legal, fair and moral manner. In this author's opinion, dropping two atomic bombs, which essentially terminated World War II, was actually a way of returning the world to a status quo situation. Peace, order and international stability were main objectives of the U.S. after World War II.

It has often been said the U.S. speaks with a "forked tongue" since she essentially wants to maintain world order on the one hand, but on the other, she builds a nuclear arsenal capable of destroying another country. It seems the U.S. is following a revisionist strategy (changing the existing order). However, the underlying principles of the status quo nation remain. To achieve objectives after World War II, the U.S. was essentially forced to counter communist expansionism. A recent example of this conflict is the call for modernizing U.S. theater nuclear forces in NATO and upgrading nuclear artillery projectiles while attempting to maintain "essential equivalence" as purported by former Secretary of Defense Schlesinger some years ago. American "status quoism" can be said to have a certain amount of revisionism built into its defensive strategy.

War has always been a word to avoid in the American culture for there is a belief in morality, and in the value of human life. Developing tactical nuclear doctrine and using tactical nuclear weapons seems to be no different. The U.S. has been reluctant to expound TNW use because of these inherent values of life. The mass casualties expected during even a limited tactical nuclear exchange could be overwhelming--something the U.S. has not had to cope with in any of their war involvements as compared with other nations.

Second, the U.S. now finds itself in a position of strategic and possibly, tactical nuclear inferiority vice the superiority they held during the 1950s and 1960s. Even though the U.S. may

still hold a slight advantage in tactical nuclear warheads and weapons systems, there is strong evidence this advantage too, is eroding quickly. (See Chapter IV.) This advantage began to erode in the late 1950s when the Soviets launched the first satellite into orbit demonstrating they had the capability to deliver nuclear warheads against the U.S. homeland. The U.S. now finds itself behind strategically in the number of launch vehicles and throw-weight capability. (Some would certainly argue that these two aspects do not necessarily denote superiority.)

One could argue this position of relative inferiority will continue to worsen and cause the U.S., in essence, to scramble for some way to counteract the growing chasm in nuclear weaponry. The SALT treaties are a good example of trying to reverse this trend.

Third, complacency is a key factor tying to the inferiority versus superiority reasoning. During the 1950s and 1960s, the U.S. political and military leaders became complacent about nuclear weapons systems. The U.S. deployed sufficient tactical nuclear weapons to the NATO theater to "beef up" conventional forces because it was evident NATO would not be capable of stopping a major attack by Soviet/Warsaw Pact conventional forces. The presence of tactical nuclear weapons left the U.S. with a confident feeling that if they had to, they could always "nuke 'em." The consequent complacent, and even apathetic, attitude began to set in.

If the attitude of complacency/apathy was present at this time, at least an attitude concerning TNW existed. In 1961, when John Kennedy became President, there was an abrupt switch in U.S.

assessment of tactical nuclear weapons. Emphasis quickly changed to conventional forces leaving tactical nuclear doctrine "high and dry." "One of the first major policy changes sought by the Kennedy Administration in 1961 was to reduce the reliance on nuclear weapons for deterrence and defense and increase the reliance on conventional forces, especially in NATO."³² Through 1960 it is quite evident emphasis in the military rested on tactical nuclear operations and the nuclear battlefield. But it quickly changed.* This negative attitude, precipitated at the highest levels, toward tactical nuclear weapons became extremely hardened "at the same time that technology was being developed to support a tactical nuclear emphasis doctrine far more reasonably and credibly than technology allowed during the days of tactical nuclear emphasis policy."³³ Additionally, this negative attitude filtered down to the troop level causing the same attitude--the "nukes" will never be used.

This leads to a discussion of the fourth reason for the nuclear doctrinal retreat. In the 1950s, the U.S. placed

* An extremely fine review of related policy actions, military articles and the like can be found in Tactical Nuclear Weapons: An Examination of the Issues, pp. 5-7. Authors, Van Cleave and Cohen, point out 50 per cent of course instruction at USACGSC in 1955 was devoted to nuclear battlefield situations. In 1957-58, the regular course curriculum included 614 hours of TNW instruction. Ten years later, the total hours devoted to TNW was 16. Now, 1979-80, the only TNW classroom instruction is an elective course (30 hours) devoted primarily to where we were and where we are, not to where we are going in TNW. However, some instruction is given in the Nuclear, Biological, Chemical (NBC) core curriculum course, but it can't be considered battlefield instruction.

thousands of tactical nuclear weapons in the NATO theater without a solid basis on how to use them, let alone what operations they would be able to conduct after initial use. The 1960 reversal of emphasis immediately shut off any possible action to develop a tactical nuclear doctrine for weapons already approaching ten years old. U.S. tactical nuclear doctrine was essentially in a state of suspended animation until 1978-1979 when the ice began to melt in conjunction with the increased emphasis on nuclear, biological and chemical (NBC) warfare.

Finally, the reversed emphasis from nuclear operations to conventional operations was precipitated by the U.S. choosing to fight a war the way the enemy supposedly wanted to fight. The alarming Soviet conventional force buildup throughout the 1960s and 1970s tended only to reinforce the psychological aversion to nuclear weapons use. Essentially what the U.S. leaders were seeing was a reluctance on the part of the Soviets to use tactical nuclear weapons. Therefore, it seems the U.S. leaders determined their use was not feasible or necessary. This obviously was a gross miscalculation since Soviet doctrine has long stated nuclear weapons to be an integral part of their combined arms team. (See Chapter IV.) U.S. leaders were, in some way, falling into a Soviet trap to deemphasize tactical nuclear weapons by forcing them to concentrate on conventional forces. This U.S. deemphasis allowed a catch-up period for the Soviets. It hasn't been until just recently the U.S. has focused on actual Soviet military doctrine and recognized the stark reality of political warfare.

Examples of TNW Doctrinal Weaknesses

Several U.S. Army and Air Force publications outline what is supposedly tactical nuclear doctrine. However, each has failed, in its own way, to define TNW doctrine. All allude to national nuclear policy, national objectives, nuclear weapons effects and nuclear weapons characteristics. For example, Air Force Manual 2-3, March 1968 (no change in 12 years), begins by including a discussion of objectives and general considerations, then characteristics of nuclear weapons and finally, includes a basic discussion of when nuclear weapons may be used.³⁴

U.S. Army Staff Officer's Field Manual 101-31-1, Nuclear Weapons Employment Doctrine and Procedures, also fails to outline basic tactical nuclear doctrine with any solidarity. It's discussion also centers on the nuclear weapons themselves and the national policy. Three employment policies are outlined.

(1) The ultimate objective of the employment of nuclear weapons is to terminate a conflict at the lowest level of hostilities on terms acceptable to the United States and its allies.

(2) National Command Authorities (NCA) would be expected to coordinate military and diplomatic efforts to insure that the conditions for use of nuclear weapons are both acceptable to allies and in accord with national goals.

(3) To realize the overall national purpose of the use of nuclear weapons, military operations should be conducted in consonance with diplomatic actions.³⁵

Although these policies should be developed and published, they are far from being military tactical nuclear doctrine even though the manual is entitled as such. Furthermore, statements such as these do little for a nation trying to espouse a firm and credible tactical nuclear doctrine.

NATO documents, Military Committee Document 14/2 (MC 14/2) and 14/3 (MC 14/3), outline NATO strategy, not doctrine. MC 14/2 was effective during the period of unquestioned U.S. nuclear superiority when "massive retaliation" was the effective deterrent strategy. Since this strategy proved inflexible, NATO adopted MC 14/3 which incorporates the current strategy of "flexible response." This strategy calls for forces, doctrine and planning which can deter Warsaw Pact aggression, but if deterrence fails, the objective is to defeat aggression at any level of conflict (conventional or nuclear).³⁶

Conclusions

With 15 to 20 years of deemphasis, it is extremely hard to return vitality to a tactical nuclear warfare program. Breaking down the psychological barriers built during those years will be a formidable task. The areas discussed in this chapter (i.e., the U.S. as a status quo nation, superiority to inferiority, complacent and apathetic attitude, lack of formal TNW doctrine from the start and choosing to fight as dictated by the enemy) have a basic and underlying impact on our lack of TNW emphasis/doctrine. Chapter VI includes guidelines to counteract these basic faults and hopefully reverse the psychological aversion to TNW.

CHAPTER IV

ANALYSIS OF USSR/WARSAW PACT CAPABILITY

Assumptions

Little needs to be stressed about the alarming Soviet military buildup, their threat to Western Europe and to world peace. The late 1979 incursion into Afghanistan left little doubt the USSR plans to conduct military operations which are in its national interest. The Soviet paranoia for a "defensive structure" so strong as to never be challenged on her homeland again, has produced an "offensive structure" far beyond imagination. It appears their "paranoia" rests with a military force "second to none." "Measured by any standard, the Soviet military buildup proceeds at a rate and over a gamut that leaves no room to doubt that Moscow's goal is military superiority."³⁷ This tendency towards military superiority certainly backs up the concept of the revisionist state as Clem and Falk have so avidly declared.³⁸

Even though the USSR has built a tremendous arsenal, it is evident by their reluctance to deploy nuclear weapons systems to any great extent within the Warsaw Pact, they too, have a somewhat careful respect for the chance of an inadvertent nuclear war occurring. Of course, one could say it is not the respect of this miscalculation on the part of its respective Warsaw Pact allies, but an extremely intense distrust for who the Warsaw Pact countries

might decide to use the weapons against. Speculation? Maybe, but the Soviets have, as the U.S. has, kept an extremely rigid control over their theater nuclear warheads. Although Non-Soviet Warsaw Pact (NSWP) countries possess nuclear capable delivery systems, all nuclear warheads appear to be under Soviet control.

If we establish a basis for U.S./NATO tactical nuclear warheads and systems using raw numbers, we must likewise establish a relative level of warheads and systems for the Soviet/Warsaw Pact nations. Even though it is inconclusive to compare numbers alone, it remains a starting point.

General Information

The International Institute for Strategic Studies (I.I.S.S.) estimates the Soviets have about 3,500 tactical nuclear warheads.³⁹ As much as this is an educated guess, many have declared the estimate as extremely low. Professor John Erikson suggests the number may have been doubled in recent years.⁴⁰ Justin Galen (a pen name for a former senior DOD civilian official), in his article "The Tactical Nuclear Balance," has also questioned this low estimate. "A recent estimate in the Bulletin of the Atomic Scientists indicates that the U.S. and U.S.S.R. combined deploy a total of about 12,000 to 14,000 nuclear weapons in Europe by tactical or theater nuclear delivery systems."⁴¹ The initial estimate of 3,500 warheads does appear extremely low. Since the initial estimate was made a number of years ago and considering the Soviet's propensity to increase their nuclear arsenal, it stands to reason their nuclear stockpile could very well be equal

to that of the U.S. (around 7,000 warheads) if not more. For example, Justin Galen indicates the 1979-1980 I.I.S.S. analysis of the military balance presents a number of major problems.

It does not take account of the large numbers of Soviet SS-19 ICBM warheads which U.S. intelligence has firm evidence are targeted on Europe, and which are employed against NATO targets in Soviet exercises.

It excludes Soviet SS-20 reloads, and gives the SS-20 a comparatively low on-line availability rate. Accordingly, only 206 SS-20 warheads are counted in the I.I.S.S. "System Utility" total. The actual figure should be closer to 280 warheads, even without reloads, and 560-840 warheads with two to three reloads per launcher.⁴²

Air Force Magazine Senior Editor, Edgar Ulsamer, said in his article, "World Hegemony Through Military Superiority,"

While U.S. knowledge of the number of theater nuclear warheads available to the Warsaw Pact is sketchy, some analysts on both sides of the Atlantic believe that there is a rough match, with both sides now having inventories of about 7,000 weapons of this kind.⁴³

A Soviet advantage in theater nuclear weapons surfaces in their capability to employ long-range and intermediate range nuclear weapons, as well as short range systems, in consonance with their offensive military doctrine. In view of this, a review of Soviet systems is in order.

Missiles

The Soviet Strategic Rocket Forces are the main nuclear threat to NATO. These forces consist of the SS-4 Sandal medium range ballistic missiles (MRBMs), SS-5 Skean intermediate range ballistic missiles (IRBMs) and mobile IRBMs, such as the MIRVd SS-20 located in western U.S.S.R. which is replacing the two previously mentioned systems. (See Table II.) The SS-4 range is

1,200nm while the SS-5 range is 2,300nm. The mobile SS-20 has a range of 3,000-4,000nm. This is a clear indication SS-20 employment would be from homeland Russia and could be targeted against Western Europe. The SS-20 is MIRVd with three warheads. All warhead yields have a wide kiloton range.

The primary Soviet battlefield or tactical nuclear missile systems which play into the equation of equivalency are the FROG (Free Rocket Over Ground), Scud, and the SS-12 Scaleboard missiles. Warhead yields range from low kiloton (perhaps less than five kilotons) to a maximum of several hundred kilotons. The FROG is an unguided rocket which entered the Soviet inventory in the late 1950s and has undergone several modifications. The present model, FROG 7, was deployed in 1965 and has a range of 10-45nm. The Scud also has a number of versions, although the most recent Scud B, deployed in 1965, has a range of 185nm. Future versions of this system are expected to have longer ranges and more accurate warheads. (See Table II.)

Recent information indicates the Soviets are deploying new short and medium range missile systems. The SS-21 (short range--65nm) and the SS-22 (medium range--500nm) missiles will pose a significant threat to NATO since the older systems will be replaced with these newer missiles having increased mobility and flexibility coupled with more accurate, lower yield warheads.

Artillery

The information on Soviet nuclear capable artillery is sparse. I.I.S.S. indicates only one nuclear capable system, the M-55,

203mm towed gun/howitzer. However, it is apparent the Soviets are capable of using not just the 203mm gun in a nuclear role, but the 152mm howitzer and the 240mm mortar as well. The ranges of these weapons are comparable to U.S. weapons and are outlined at Table II. The warhead yields generally run in the sub to very low kiloton range and are equivalent to the U.S. nuclear artillery systems.

In the past the Soviets have placed a great deal of public emphasis on missile systems while apparently neglecting nuclear artillery. It was generally noted that the reason for this was perhaps because the Soviets were not capable of manufacturing the smaller yield nuclear projectiles. However, this may not be the case now.

The Soviets may or may not deploy larger numbers of nuclear artillery rounds. They are, however, improving their capability to selectively use nuclear weapons . . . on the battlefield in ways which minimize collateral damage and unnecessarily high weapons yields. While they may never choose to fight in the way NATO plans, it is virtually certain that they will be able to meet even the most selective use of low yield weapons at a sufficiently low level of escalation so that NATO cannot claim an advantage in this area.⁴⁴

For anyone to think the Soviets are technologically incapable of building and deploying a small yield, highly accurate artillery projectile capable of destroying a "dug-in" defensive military unit is wishful thinking. The Soviets have proven as highly inaccurate all predictions of overall incapability to produce technologically advanced weapons. Trends in Soviet defense spending indicate they intend to gain the advantage militarily.

Additionally, they have spent themselves into the technologically advanced weapons realm since the mid-1960s. It wouldn't be any surprise if an advanced nuclear artillery projectile is deployed soon.

Aircraft

The Soviets have improved their strike aircraft significantly in the past several years. Their force has not only been upgraded quantitatively, but qualitatively.

Since 1970, the Soviet Union has produced more than 5,000 tactical aircraft . . . and maintains an annual military aircraft production rate of approximately 1,800. What is important is not merely the quantity of aircraft deployed (although this fact can scarcely be ignored), but the characteristics of the modernization program and its "fit" with the evolution of Soviet theater warfare doctrine.⁴⁵

Soviet Air Forces consist of three major components: Frontal Aviation, Long-Range Aviation and Military Transport Aviation. The Frontal Aviation assets are comparable to the USAF's tactical fighter aircraft from the Tactical Air Forces. Frontal Aviation aircraft considered nuclear capable include: MiG-21 (NATO Fishbed J/K/L); MiG-27 (NATO Flogger D); Su-7 (NATO Fitter A); Su-17/20 (NATO Fitter C and D); and the Su-19 (NATO Fencer). Another aircraft considered to be a strike aircraft which is nuclear capable and may be employed in battlefield situations, is the Tu-22 (NATO Blinder). (See Table II.)

Although little is known of the nuclear warhead yields, it is safe to assume the yields are equivalent, if not larger, to U.S. tactical aircraft nuclear bomb yields which run in the low kiloton

range to as high as a one megaton yield. Most Soviet aircraft carry only one bomb, but it is known the Blinder carries three weapons, and the Fitter C/D and Fencer carry two weapons. (See Table II.)

Soviet Military Strategy and Doctrine

Soviet weapons certainly present a formidable deterrent, if not threat, to other countries. Yet it is apparent sheer numbers of weapons and weapons systems capability do not, in themselves, make a war-winning military force. The remaining factor which completes the war-winning equation is the military strategy and doctrine in which these weapons and weapons systems will be employed. What effect does strategy and doctrine have on the outcome of a war? The Soviets believe, and their actions bear this out, military doctrine and force development must be married to be successful.

The Soviets have a very simplified military doctrine which applies to nuclear war as well as conventional: if war is waged they will use any and all means to win the war thus achieving the political aim of totally destroying the enemy.

Soviet military doctrine has an offensive character . . . the Soviet Union . . . will conduct the war which the enemies impose on them in the most offensive manner in order to attain the smashing of the enemy in short times.

Soviet military doctrine allocates the decisive role in contemporary war to nuclear missile weapons. At the same time it considers that along with the nuclear missile strikes of a strategic and operational-tactical character, the armed forces will employ conventional armament.⁴⁶

The art of conducting military operations with the use of nuclear weapons and that of employing conventional forces have many fundamental differences. But they are not

TABLE II. Soviet Union/Warsaw Pact Tactical Nuclear Weapons Systems

Weapons System Category and Type	Range	Inventory	Warheads, Yield
Missiles:			
SS-4 Sandal	1200 nm	500	1, 1 megaton
SS-5 Skean	2300 nm	90	1, 1 megaton
SS-20	3-4000 nm	120	3, 150 KT
SS-21	65 nm	Unk	Unk
SS-12 Scaleboard	500 nm	Unk	1, megaton range
FROG 7	45 nm	Unk	1, KT range
Scud B	185 nm	Unk	1, KT range
SS-22	500 nm	Unk	Unk
Artillery:			
203mm Towed Gun/Howitzer	18 nm	Unk	1, KT range; Possibly dual capable

SOURCES: I.I.S.S., The Military Balance 1979-1980; Soviet Commander's Tactical Planning Worksheet, Dept. of Command, USACGSC (July 1979).

TABLE II (Continued). Soviet Union/Warsaw Pact Tactical Nuclear Weapons Systems

<u>Weapons Systems Category and Type</u>	<u>Range</u>	<u>Inventory</u>	<u>Warheads, Yield</u>
Artillery (continued):			
152mm Howitzer	18 km	Unk	1, KT range; Possibly dual capable
240mm Mortar	10 km	Unk	Low KT range
Aircraft:			
MIG-21	1150 nm	1000	1, KT range to 1 megaton
MIG-27	900 nm	1400	1, KT range to 1 megaton
Su-7	1400 nm	220	1, KT range to 1 megaton
Su-17/20	1100 nm	640	2, KT range to 1 megaton
Su-19	900 nm	230	1, KT range to 1 megaton

SOURCES: I.I.S.S., The Military Balance 1979-1980; Soviet Commander's Tactical Planning Worksheet, Dept. of Command, USAACGSC (July 1979).

in opposition, are not mutually exclusive, and are not isolated one from the other; on the contrary, they are⁴⁷ closely correlated and are developing as a single body.

Soviet military thought and ideology are based on the Marxist/Leninist thesis that "war is simply a continuation of politics by other (i.e., violent) means."⁴⁸ This precept applies to all types of wars. The Soviets do not, under any circumstances, believe nuclear war to be unthinkable. Their doctrine emphasizes the use of nuclear weapons as an integral part of military operations.

According to Douglass and Hoeber in Soviet Strategy for Nuclear War, "with the onset of war a distinct change occurs. During war, military doctrine, which is the Soviet equivalent of U.S. national security policy, withdraws somewhat into the background."⁴⁹ It appears the Soviets believe war to be "guided primarily by military-political and military strategic considerations . . . war and armed conflict are guided not by doctrine but by strategy."⁵⁰ But Soviet strategy then is obvious, they intend to prepare and be ready for any war.

The Soviet government . . . and their armed forces must be ready primarily for a world war . . . the Armed Forces of the Soviet Union and the other socialist countries must be prepared above all to wage war under conditions of the mass use of nuclear weapons by both belligerent parties.

. . . the preparation and waging of just such a war must be regarded as the main task of the theory of military strategy and strategic leadership.⁵¹

The basic premises that should be understood about Soviet military doctrine are its offensive character, the importance of nuclear weapons in fighting a war and a definite belief a war will be decisive in its early stages. This last premise alludes to a

major Soviet strategy which runs throughout Soviet literature: the reliance on a preemptive strategy. Preemptive strategy is, in simplified terms, being able to anticipate the enemy's use of nuclear weapons and launch a preemptive attack against his forces. Initiative is also very basic to the Soviet's war fighting strategy and by preempting the enemy he continues to have the advantage of initiative.

Several Soviet literary examples provide a basis for this preemptive strategy. Two follow.

One of the decisive conditions for success in an operation is the anticipating of the enemy in making nuclear strikes, particularly against the enemy's nuclear missile weapons.⁵²

The importance of the principle of surprise increases as the means of warfare develop. Surprise permits anticipating the enemy in delivering strikes, catching him unawares, paralyzing his will, sharply reducing his combat effectiveness, disorganizing his control, and creating unfavorable conditions for defeating even superior forces.⁵³

The Soviet preemptive strategy is at odds with current U.S. nuclear policy in that even though the U.S. reserves the right to first use of nuclear weapons if all else fails, the Soviets fully expect to use nuclear weapons if it appears NATO is about to resort to their use.

Conclusion

In conclusion, one can clearly see the Soviets emphasizing a clear cut doctrine on any type of war or war fighting. Their nuclear stockpile is without a doubt coupled with this offensive strategy and doctrine. Nuclear weapons to the Soviets are a new, more destructive and efficient means of waging war.

However, as stated in Marxist/Leninist theory, the nature of war
is still determined by politics.

CHAPTER V

DETERRENCE ANALYSIS

General

U.S. deterrent capability is present. If it hadn't been up to now, the Soviets would be controlling major portions, if not all, of Western Europe. Yet, is that deterrence breaking down with the advent of new weapons and weapons systems technology? Several major points need to be discussed to determine an appropriate and objective answer. But first, a definition of deterrence is in order. Simply stated, deterrence is the act of keeping someone from doing something based on fear of the consequences. The definition indicates a psychological aspect is involved as well as a material aspect in making the enemy believe you have what you say you have and will do the things you say you will. With this in mind, let's discuss the major roles in determining an effective or relative deterrence.

TNW Strength

As indicated in Chapter II, strength alone does not mean superiority. TNW strength consists of a whole gamut of things. Weapons numbers, yield, accuracy, range and technology all play significant roles in the area of strength. The key to strength is in application--how you use what you have. Today's armed forces have a common saying which is quite appropriate here. "We must do

more with less." The TNW selective employment procedures (SEPs) which will be used in the NATO theater in the event of war are good examples of this. Weapons will be employed in a nuclear weapons package which is a "discrete grouping of nuclear weapons for employment in a specified area during a short time period to support a corps tactical mission."⁵⁴ The prime question is if you will use them rather than how you use them.

The U.S. TNW position appears strong, but definite improvements are needed to overcome some significant limitations. Some of these improvements have already been pointed out in Chapter II. The latest nuclear modernization program which may strengthen U.S. deterrent capability is the recent NATO approval to deploy the Pershing II missile and the ground-launched cruise missile (GLCM). This latest move by NATO calls for deploying 108 medium-range Pershing II missile launchers (to replace existing Pershing Ia launchers) and 464 GLCMs, all with single warheads.⁵⁵ This move also includes withdrawing 1,000 U.S. nuclear warheads (presumably tactical) already in Europe. Even though the number of warheads is being reduced overall, the previously mentioned aspects of accuracy, range and technology have been improved considerably.

Survivability/Vulnerability

A second basic aspect or requirement of deterrence is weapons survivability in case of enemy surprise attack. Obviously, warheads and weapons systems are of no value if destroyed. The present situation of weapons vulnerability to nuclear strike is critical. Soviet strategy notes nuclear strike capability as

first priority targets. In any case, NATO survivability after a nuclear strike is questionable.

. . . there is a problem of NATO's vulnerability to a Soviet first strike. The Warsaw Pact today has a massive incentive to selectively preempt or first strike, and to exploit NATO's weakness. Unless NATO has time to fully execute its deployment plans--which takes at least 48-72 hours--the Pact can now destroy virtually all of NATO's theater nuclear delivery systems (other than artillery) and nuclear stockpile using only a fraction of Russia's warheads. The resulting collateral damage would virtually destroy the ability of NATO armies to leave their peacetime casernes as a functioning force.⁵⁶

Among the first Soviet nuclear strike targets are the U.S. nuclear capable aircraft. Although QRA aircraft are presently sheltered in third generation aircraft shelters with blast doors, one can only speculate on how many aircraft might survive a direct hit by a preemptive attack with Soviet MRBM SS-20s or a like missile system. Whether any surviving aircraft could take off is also a matter of speculation.

The vulnerability and questionable survivability of approximately 100 nuclear weapons storage sites is even more alarming. These sites were constructed for security precautions rather than attack by nuclear missiles or for that matter, conventional weapons. The bunkers/igloos where weapons are stored were not constructed to withstand blast and overpressure of a nuclear strike.

This critical area of survivability leaves much to be desired and should be an area the U.S. places major emphasis on in the near term. A survivable storage site would most definitely provide the added benefit of security.

Flexibility

When speaking of survivability/vulnerability, one must not neglect flexibility (accuracy, selectivity, and the ability to retarget rapidly), for it is an important part of survivability/vulnerability. Being able to move the weapons when needed has been a major concern of many in the nuclear weapons business. Evacuation of weapons deployed near battle zones is also a major concern. If enemy breakthroughs occur, weapons must be evacuated without delay. Without the vital aspect of flexibility or mobility the weapons again are useless.

Aircraft Penetration

One vital aspect of striking preplanned enemy targets is the capability of U.S. nuclear aircraft to penetrate the blanket Soviet air defense system. This system is the most sophisticated in the world. Although not all systems are deployed along West German borders, the Soviets have some 10,000 launchers at over 1,000 sites. Their Air Defense Force consists of some 2,600 interceptors and approximately 7,000 early warning and ground control intercept (EW/GCI) radars.⁵⁷

The Soviet Union has always placed heavy emphasis on air defence, evident not only from the large number of interceptor aircraft . . . but from the strength of her deployment of high-quality surface-to-air missiles and air defence artillery both in the Soviet Union and with units in the field. These defences could pose severe problems for NATO strike aircraft drawing off much effort into defence suppression.⁵⁸

This defense system alone indicates U.S. tactical bombers have their work cut out for them. Electronic warfare systems capable of jamming enemy systems are available, however technology in this

field is ever progressive and the penetration capability of U.S. fighters appears questionable. Speaking of penetration, I.I.S.S. says:

There is clearly no such assurance in the case of aircraft. [Comparing missile penetration to aircraft penetration capability.] Yet it is necessary to differentiate between modern high-performance aircraft with good ECM [electronic countermeasure] equipment and low-level performance and more elderly aircraft which can only fly high and have no means of deflecting enemy radars and missiles.⁵⁹

Range may not seem important in an arithmetical equation of deterrence capability. However, it effects all requirements of deterrence discussed to this point. The Soviets are able to target the few NATO airfields, nuclear storage sites and missile sites from launch sites within the Soviet Union. Unfortunately, NATO does not have a countering capability. The longest range system, in addition to nuclear strike aircraft, is the Pershing Ia missile (450 nm range) which is not capable of striking launch targets in the USSR from sites in the FRG. The new Pershing II missile and the GLCMs NATO will deploy may remedy the situation in future years.

Training

Apart from actual weapons systems in the analysis of deterrence is the essential variable of training. Training can be translated into preparedness or readiness. If troops are trained properly to fight in, around and after nuclear strikes, the deterrent capability increases considerably. In this area the Soviets have a marked advantage over U.S. troops. Soviet

doctrine has always emphasized an integrated nuclear/non-nuclear battlefield and trains accordingly.

Operations are predicated on the use of nuclear strikes to create the conditions for exploitation of mobile armor and infantry units in combination with airborne forces . . . Emphasizing the requirement for continually maintaining the offensive, operational strategy calls for rapid day and night movement of maneuver forces in combined arms operations . . .⁶⁰

As for the U.S., the lack of interest in nuclear war is as much prevalent in the military as in the civilian sector. The lack of a positive, emphatic military doctrine is reflected in field training exercises where integrated nuclear/non-nuclear battlefield exercises are almost non-existent. But the primary hurdle the U.S. must overcome is psychologically preparing the troops to fight in a nuclear environment. Even if training is extremely efficient the psychological shock of fighting in such an environment may be more than U.S. military leadership can handle. Of course, the psychological shock will be prevalent among the enemy as well, but it is a proven fact, well trained troops fight better, with more zeal and cohesiveness.

Any kind of NATO land force theater nuclear exercise training is unusual. Soviet writings indicate that Warsaw Pact nuclear exercise training is the rule.

It is uncertain that even half of NATO's men in uniform in the Center Region have had any meaningful training for nuclear operations, or will receive any during their period of active service. Virtually all Warsaw Pact men in uniform receive significant nuclear operations training.

The training of NATO officers for theater nuclear operations ranges from negligible to farcical. While a few dedicated officers in each nation, in SHAPE, and in the International Military Staff have done an outstanding job of preparing NATO to conduct tactical nuclear deterrence and selective strike options, the vast majority of NATO officers are unprepared for theater nuclear war. Soviet

and Warsaw Pact officer training for nuclear operations is intensive and technically excellent, although experts differ over its military realism.⁶¹

During what little training is accomplished in NATO, so few people are involved in the exercise that feasible training goals can hardly be achieved. The sensitivity/classification and personnel programs involved with nuclear exercises/operations has tended to degrade the quality of training and the overall effectiveness. Although the U.S. is becoming more aware of the need to enhance their nuclear operations training, much is left to be accomplished.

Warhead Reliability

In Chapter II, this author broached the subject of the age of U.S. artillery fired atomic projectiles (AFAPs). Dr. Kerr's statements (See page 14.) certainly are cause for concern since weapon reliability could well be affected considering the age of the present AFAPs. "The W35 [8-inch warhead] entered the inventory nearly 24 years ago and was designed with the technology of the 1950s."⁶² If these AFAPs are not replaced, our deterrent capability suffers as time passes and existing warheads age.

Considering a specified number of warheads are planned against a specified number of targets during selective or general employment planning of nuclear fires, U.S. planners must have an absolute assurance the planned fires will be effective. "Back-up" weapons certainly are not the answer if initial fires fail. Crucial time passes from nuclear release to nuclear execution. To re-execute a portion of a nuclear employment plan would be risking

almost certain counterfire by enemy troops. Enemy troop concentrations would be extremely close to friendly troop units and populous areas which had previously been out of collateral damage range.

Considering the criticality of this problem and its overall importance to an effective TNW deterrent it is imperative old AFAPs be replaced with the new projectiles.

Communications

The U.S. has made considerable strides in the area of communications in recent years, yet communications in the nuclear area, or when tactical nuclear weapons are introduced, seem lacking. In requesting nuclear release, communication must be effected through an antiquated and highly vulnerable communications network. If the Soviets initiated a preemptive strike against nuclear units, they could easily knock-out vital, unhardened communications. This is extremely critical since not only must nuclear release come through this communication process but the nuclear codes used to remove permissive action links (PALs) from individual warheads are also passed through the system. Warheads are inactive until the PAL is removed. Without the codes/instructions it is impossible to arm the weapon. Without an effective and redundant communications system devoted to nuclear weapons release, U.S. deterrent capability is compromised.

Doctrine

How does doctrine apply to this analysis? Doctrine is the underlying factor which pulls all of these previously mentioned

areas together. It is much like the foundation of a large building. Much planning and forethought must go into constructing a building foundation--location, strength and composition all play a major role. If the builder does not place major emphasis on the foundation, the investment he has placed in constructing the building may be lost. But the builder must have confidence in his foundation otherwise the complete building program is in jeopardy. Such is the case with developing a firm TNW doctrine. It is the foundation for all tactical nuclear operations. If it is not stated clearly, emphatically and confidently, the complete TNW program falters causing a major limitation to our deterrent capability.

Through the previous discussion this author has noted many problem areas with tactical nuclear operations. Many of these problems are a direct result of a lack of a firm foundation--doctrine. Although many areas are being improved, until the lack of confidence in tactical nuclear doctrine is remedied, the "how and why" of tactical nuclear operations will not be attained.

Conclusions

As stated in the outset of this chapter, the U.S. has a strong nuclear deterrent capability. However, limitations in the areas of strength, survivability/vulnerability, flexibility, penetration capability, training and communications decrease the effectiveness of that deterrent capability. The most basic problem many have argued is the lack of a viable and emphatic tactical nuclear doctrine. Until the doctrine problem is solved,

the U.S. and NATO will continue to be in a precarious position--weak and exposed to a possible Soviet attack. The question arises, what steps must be taken to alleviate this doctrinal weakness? Chapter VI includes basic guidelines to consider in formulating a more progressive theater nuclear doctrine.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

General

This chapter includes guidelines which this author believes will strengthen the tactical nuclear doctrine of the U.S./NATO. Without establishing the firm foundation to build on, the entire TNW structure may one day fail. Doctrine, as defined by Webster's Seventh New Collegiate Dictionary, is "a principle or position or the body of principles in a branch of knowledge or system of belief."⁶³ Webster's goes on to say doctrine "implies a principle accepted by a body of believers or adherents to a philosophy or school."⁶⁴ With this definition in mind, let's associate it with what we now call U.S. tactical nuclear doctrine.

Doctrinal Discussion

The authors of "Criteria for Tactical Nuclear Warfare Employment Decisions, Final Report," approach doctrine as being "any coherent series of questions about nuclear use which anticipate the circumstances of possible war is a legitimate outline of a theater nuclear doctrine."⁶⁵ Additionally, they state a broad political objective is required to "give meaning to the necessity to choose."⁶⁶ These authors put forth a doctrinal model which asks ten questions. The model includes questions pertaining to why weapons should be used; under what circumstance; size, scope

and intended effects when first use is a consideration; size, scope and intended effects when responding to initial use by the enemy; follow-on actions; second follow-on actions; strategic use; how strategic weapons should be employed; and finally, under what circumstances should the U.S./NATO initiate general nuclear response.⁶⁷ This author suggests that a questioning doctrinal model such as presented leads to a multi-faceted, broad, incomplete and divisive tactical nuclear doctrine. While the questions presented indeed must be answered, the answers thus far have proven extremely complicated and much opinionated. What is required is a doctrine which includes the following characteristics: simplicity, positivity, believability, flexibility, specificity and singularity. It must be complete, goal-oriented, emphatic and formulated prior to weapons acquisition. Can the U.S. firmly state she has a tactical nuclear doctrine including these characteristics?

What is needed is a well thought-out doctrine developed by a group of individuals versed in tactical nuclear affairs--not a "mish-mash" of words "waffling" the subject, vacillating between use, limited use and non-use. Why? The doctrine should be a visible sign to any aggressor of the U.S. firm intentions to use the weapons. The doctrine should not be interspersed with "ifs, ands and buts." It should be clearly stated with an absolute objective (political and military). After all, the reason the U.S. deployed nuclear warheads to Europe was not just to store them.

The Soviets define military doctrine as:

a system of guiding views and principles of a state on the character of war under given specific historical conditions, the determination of the military tasks of a state, the armed forces, and the principles of their construction, and also the methods and forms for the solution of all these tasks, including armed conflict, which issue from the goals of the war and the socio-economic and military-technical capabilities of a country.⁶⁸

Essentially, this definition says Soviet military doctrine is a set of guidelines to attain a specific goal. The Soviets have expressed this simplicity in their nuclear doctrine which incidentally, does not differentiate between tactical and theater nuclear doctrine. Their doctrine and strategy is based on aims rather than locations. Whether these aims are local or global makes little difference. The goal of both Soviet military doctrine and strategy "is total destruction of the enemy. Lenin stated that in conducting combat 'we must not "knock down" but rather destroy the enemy'"⁶⁹ The Soviets never let one forget their final objective.

The most striking difference between Soviet and U.S. doctrine is the objective. The Soviets will use anything and everything in the total victory while the U.S. has indicated its objective is merely a termination of hostilities on acceptable terms. This objective is far from being positive. What are acceptable terms?

U.S. Theater Nuclear Policy and Nuclear Strategy

Prior to outlining guidelines for tactical nuclear doctrine we must also define U.S. theater nuclear policy and U.S. nuclear strategy, for it is these two aspects which lead to doctrine.

Briefly, U.S. theater nuclear policy is tactical nuclear weapons are in Europe to deter and to defend, if required, and TNW will be used in certain, mostly unspecified, situations. On the other hand, NATO strategy has been "flexible response" since 1967 when it was accepted by NATO foreign ministers in MC 14/3. Flexible response provides for forward defense, direct defense, deliberate escalation and general response.

Conclusions

1. A firm, explicit U.S. tactical nuclear doctrine has not existed from the time tactical nuclear weapons were first deployed to Europe in the mid 1950s.
2. The emphasis on conventional forces beginning early in 1961 paralyzed any efforts to formulate a doctrine of strength.
3. The lack of emphasis promoted a lack of confidence, reduced funding for tactical nuclear programs, non-existent nuclear training and reduced expertise.
4. Reduced emphasis and confidence gave way to a psychological aversion to using tactical nuclear weapons and any type of nuclear war.
5. U.S. strategic and tactical superiority has eroded to a less than parity situation further enhancing the psychological aversion to nuclear weapons.
6. Doctrine has suffered from ill-defined and confusing policy and strategy. Without these two being nailed down first, an effective doctrine cannot be established.

7. Using tactical nuclear weapons in a defensive posture may prove infeasible since weapons release may be too late to produce a positive effect on the battle. Request procedures for nuclear release authority are slow and outmoded. No alternative plans exist which request nuclear release through a specific level and then place the release authorization on a "hold" status until needed.
8. The U.S. nuclear warheads are in a critical state of aging. If not corrected, warhead reliability on the battlefield may be questionable.
9. U.S. nuclear stockpiles/weapons storage areas are highly vulnerable to enemy nuclear, chemical or conventional attack.
10. Communications procedures are cumbersome; equipment is outdated, vulnerable and lacks redundancy. This effects U.S. capability to actively employ nuclear weapons since weapons release and PAL codes are passed by message to lower echelons.
11. Training in a nuclear weapons environment is near non-existent. The number of people involved in training is minimal since it entails working with classified material and placing people in the Personnel Reliability Program.
12. U.S./NATO deterrence is effective but problem areas, unless resolved, eventually will erode deterrence to the point it may be tested.
13. Modernization programs underway for theater nuclear forces (Pershing II and GLCM) and nuclear artillery projectiles for the 8-inch and the 155mm howitzers will enhance our deterrence.

14. Existing publications are poorly written, out of date and do not adequately address specific areas such as doctrine, strategy and policy.

Recommendations

1. Rewrite existing tactical nuclear doctrine. However, do not single out tactical nuclear weapons as such, but group both tactical nuclear weapons or battlefield weapons and those considered as theater nuclear weapons in one doctrine. Most weapons can be used in both a tactical and strategic mode with the exception of the nuclear artillery projectiles.
2. Correct problem areas outlined in the above conclusions. While these improvements alone will not provide a solution to the doctrinal dilemma, they provide significant relative advantages.
3. Rewrite major U.S. Army and Air Force publications to incorporate theater nuclear policy, strategy and doctrine in that order. This will provide a basic and logical order in presenting the reasoning behind nuclear doctrine.
4. Establish a comprehensive training program in all U.S. services concentrating on psychologically preparing the soldier to fight in a nuclear environment. Training programs should involve as many individuals as possible.
5. A new doctrinal statement should be developed having the qualities and characteristics suggested in this and previous chapters as guidelines. The suggested doctrinal statement should appear much like the following:

Doctrinal Statement

The United States will use nuclear weapons where and when deemed necessary, to prevent the infringement upon Western European territory by any aggressor nation. Selective employment packages will be used which will effectively terminate the enemies will to continue. Conventional forces or nuclear weapons will be used to exploit the battle situation. The goal of using theater nuclear weapons is not to escalate to general nuclear war but to cause the enemy to withdraw in defeat to previously established international boundaries.

Final Remarks

There are no miracle remedies to a situation that has taken thirty years to develop. Just publishing a doctrinal statement cannot possibly change the attitude of the military or civilian populace concerning TNW. The fact remains, certain changes must be made, and they must be made soon. The U.S. doesn't have the luxury of waiting around anymore resting on nuclear superiority. It will take a concerted effort on the part of all in the DOD community. Expressing this new doctrinal statement and making the enemy believe you can do what you say you can is the most effective deterrent for which there is no substitute.

FOOTNOTES

Chapter I

1. U.S. Department of Defense, Report of the Secretary of Defense James R. Schlesinger to the Congress on the FY 1975 Defense Budget and FY 1975-1979 Defense Program (Washington D.C.: Government Printing Office, 1974), p. 82.
2. Letter to Senator John Stennis from President Jimmy Carter, July 11, 1977.
3. Harold J. Clem and Stanley L. Falk, National Security Management, The Environment of National Security (Washington D.C.: National Defense University, 1977), p. 52.
4. Ibid.
5. Ibid., p. 53.
6. David P. Calleo, "The European Coalition In a Fragmenting World," International Issues and Perspectives (Washington D.C.: National Defense University, 1979), p. 87.
7. Clem and Falk, p. 9.
8. William R. Van Cleave and S. T. Cohen, Tactical Nuclear Weapons: An Examination of the Issues (New York: Crane, Russak & Company, Inc., 1978), p. 19.
9. Major Ronan I. Ellis, "Beyond Deterrence, A Rational Approach to the Deployment of Tactical Nuclear Weapons In Europe," Field Artillery Journal (November-December 1974), p. 28.
10. Van Cleave and Cohen, pp. 21-22.
11. Van Cleave and Cohen, pp. 58-60.

Chapter II

12. Jorma K. Miettinam, "Enhanced Radiation Warfare," Bulletin of the Atomic Scientists (September 1977), p. 36.

13. Van Cleave and Cohen, p. 15.
14. Headquarters, Training and Doctrine Command/United States Army Field Artillery School, "Operational Concept for the Tactical Employment of Nuclear Weapons on the Integrated Nuclear/Non-Nuclear Battlefield (Final Draft)" (16 July 1979), p. 19.
15. Ibid., Appendix B, p. 5.
16. Van Cleave and Cohen, p. 47.
17. United States Army Command and General Staff College, Organization for Combat-G3 Worksheet (Ft. Leavenworth, Ks., 20 June 1979).
18. The International Institute for Strategic Studies, The Military Balance 1979-1980 (Adlard and Son, Ltd., Bartholomew Press, Dorking, 1979), p. 88.
19. Truman R. Strobridge and Bernard C. Nalty, "The Roar of the 8-Incher," National Defense (September-October 1979), p. 31.
20. Harold Brown, Secretary of Defense, Department of Defense Annual Report Fiscal Year 1980 (U.S. Government Printing Office, Washington, D.C., 25 January 1979), p. 137. Hereafter called DOD Annual Report, FY 1980.
21. Edgar Ulsamer, "New Critical Defense Needs," Air Force Magazine (February 1979), p. 28.
22. The International Institute for Strategic Studies, The Military Balance 1978-1979 (Adlard and Son, Ltd., Bartholomew Press, Dorking, 1978), p. 6.
23. John Marriott, "Tactical Nuclear Weapons," Army Quarterly and Defense Journal (April 1978), p. 146.
24. DOD Annual Report, FY 1980, p. 137.
25. F. Clifton Berry, Jr., "Pershing II, First Step in NATO Theatre Nuclear Force Modernization?", International Defense Review, Volume 12, No. 8 (1979), p. 1306.
26. Ibid.
27. "U.S. Security Issues in Europe: Burden Sharing and Offset, MBFR and Nuclear Weapons," a staff report prepared for the Subcommittee on U.S. Security Agreements and Commitments Abroad of the Senate Committee on Foreign Relations, 93d Congress, First Session (1973), p. 15.

28. The International Institute for Strategic Studies, The Military Balance 1979-1980 (Adlard and Son, Ltd., Bartholomew Press, Dorking, 1979), p. 119.

29. "Authority to Order the Use of Nuclear Weapons (United States, United Kingdom, France, Soviet Union, People's Republic of China)," a staff report prepared for the Subcommittee on International Security and Scientific Affairs of the Committee on International Relations, 94th Congress, First Session (December 1975), p. 1.

30. Headquarters, Department of the Army, Field Manual 100-5, Operations (Washington, D.C., 1 July 1976, Change 1, 29 April 1977), p. 10-9.

Chapter III

31. Clem and Falk, p. 52.

32. Alain C. Enthoven and K. Wayne Smith, How Much Is Enough: Shaping the Defense Program 1961-1969 (New York: Harper & Row, 1971), p. 117.

33. Van Cleave and Cohen, p. 7.

34. Department of the Air Force, Air Force Manual 2-3, Tactical Air Operations--Employment of Nuclear Weapons (Washington, D.C., 6 March 1968), pp. 1-6.

35. Headquarters, Department of the Army, Field Manual 101-31-1, Staff Officer's Field Manual, Nuclear Weapons Employment Doctrine and Procedures (Washington, D.C., March 1977, Change 1, 21 November 1977), p. 3.

36. United States Department of Defense, Secretary of Defense, James R. Schlesinger, The Theater Nuclear Force Posture in Europe: A Report to the United States Congress in Compliance with Public Law 93-365 (1 April 1975).

As reprinted in:

U.S. Department of the Army Command and General Staff College, Tactical Nuclear Operations Reference Book 101-31 (Ft. Leavenworth, Ks., January 1980), p. 1-7.

Chapter IV

37. Edgar Ulsamer, "Moscow's Goal is Military Superiority," Air Force Magazine (March 1980), p. 42.

38. Clem and Falk, p. 52.

39. The International Institute for Strategic Studies, The Military Balance 1978-1979 (Adlard and Son, Ltd., Bartholomew Press, Dorking, 1978), p. 81-85.

40. John Erickson, "Soviet Military Capabilities in Europe," Journal of the Royal United Services Institute for Defense Studies 120 (March 1975), p. 67.

41. Justin Galen, "Tactical Nuclear Balance, Part One: Recent Force Trends and Improvements," Armed Forces Journal International (December 1977), p. 30.

42. Justin Galen, "Flaws in I.I.S.S. Military Balance Cause Major Problems for NATO," Armed Forces Journal International (December 1979), p. 28.

43. Edgar Ulsamer, "World Hegemony Through Military Superiority," Air Force Magazine (March 1979), p. 47.

44. Justin Galen, "Can NATO Meet Its Toughest Test? Strategic and Theater Nuclear Forces for the 1980s," Armed Forces Journal International (November 1979), p. 54.

45. William Schneider, Jr., "Trends in Soviet Frontal Aviation," Air Force Magazine (March 1979), p. 80.

46. Gen Maj. S. N. Kozlov, Spravochnik Ofitsera [The officer's handbook], trans. U.S. Air Force, Foreign Technology Division, Wright Patterson Air Force Base, AD 733-207 (Dayton, Ohio: October 26, 1971), p. 116.

47. Andrei A. Grechko, On Guard for Peace and the Building of Communism, trans. Joint Publications Research Service, 1972; first published in Moscow in 1971), pp. 51-52.

48. B. Byely et al., Marxism-Leninism on War and Army (A Soviet View), trans. U.S. Air Force, Soviet Military Thought Series, no. 2 (Washington, D.C.: Government Printing Office, 1974), p. 2.

49. Joseph D. Douglass, Jr. and Amoretta M. Hoeber, Soviet Strategy for Nuclear War (Hoover Institution Press, 1979), p. 7.

50. Kozlov, p. 116.

51. V. D. Sokolovskiy, Soviet Military Strategy, ed. Harriet Fast Scott (New York: Crane, Russak & Co., 1968), pp. 188-195.

52. N. S. Lomov, ed., Scientific-Technical Progress and the Revolution in Military Affairs (A Soviet View) (Moscow, 1972),

trans. U.S. Air Force (Washington: Government Printing Office, 1974), Soviet Military Thought, no. 3, p. 147.

53. V. Ye. Savkin, The Basic Principles of Operational Art and Tactics (A Soviet View) (Moscow: 1972), trans. U.S. Air Force (Washington: Government Printing Office, 1974), Soviet Military Thought, no. 4, p. 282.

Chapter V

54. Headquarters, Department of the Army, Field Manual 6-20, Fire Support in Combined Arms Operations (30 September 1977), pp. 6-9.

55. Eugene Kozicharov, "Theater Nuclear Forces Approved By NATO," Aviation Week and Space Technology (17 December 1979), p. 14.

56. Justin Galen, "Can NATO Meet Its Toughest Test? Strategic and Theater Nuclear Forces for the 1980s," Armed Forces Journal International (November 1979), p. 50.

57. The International Institute for Strategic Studies, The Military Balance 1979-1980 (Adlard and Son, Ltd., Bartholomew Press, Dorking, 1979), p. 9.

58. Ibid., p. 112.

59. Ibid., p. 116.

60. Van Cleave and Cohen, p. 65.

61. Justin Galen, "Theater Nuclear Balance, Part Two: The NATO/Warsaw Pact Imbalance," Armed Forces Journal International (January 1978), p. 24.

62. COL William E. Serchak, "Artillery Fired Atomic Projectiles--A Field Artilleryman's Viewpoint," Field Artillery Journal (March-April 1980), p. 12.

Chapter VI

63. G. & C. Merriam Co., Webster's Seventh New Collegiate Dictionary (1963), p. 246.

64. Ibid.

65. Strategic Studies Institute, U.S. Army War College. "Criteria for Tactical Nuclear Warfare Employment Decisions (U)"

Final Report, Vol. II, (Carlisle Barracks, Penn., 15 October 1978), p. 6. SECRET.

66. Ibid.
67. Ibid., p. 8.
68. Kozlov, p. 109.
69. General Major A. S. Milovidov, ed., "The Philosophical Heritage of V. I. Lenin and Problems of Contemporary War (A Soviet View)," trans. U.S. Air Force, Soviet Military Thought Series, no. 5 (Washington, D.C.: Government Printing Office, 1974), p. 88.

BIBLIOGRAPHY

Books

Beaufre, André. Strategy for Tomorrow. New York: Crane, Russak & Company, Inc., 1974.

Byely, B., et. al. Marxism-Leninism on War and Army (A Soviet View). Translation: U.S. Air Force, Soviet Military Thought Series, No. 2. Washington D.C.: U.S. Government Printing Office, 1974.

Clem, Harold J. and Stanley L. Falk. The Environment of National Security. Washington D.C.: National Defense University, 1977.

Douglass, Joseph D., Jr., and Amoretta M. Hoeber. Soviet Strategy for Nuclear War. Stanford, California: Hoover Institution Press, 1979.

Enthoven, Alain C. and Wayne Smith. How Much Is Enough: Shaping the Defense Program 1961-1969. New York: Harper & Row, 1971.

Gomper, David C., et. al. Nuclear Weapons and World Politics, Alternatives for the Future. New York: McGraw-Hill Book Company, 1977.

Grechko, Andrei A. On Guard for Peace and the Building of Communism. Translation: Joint Publications Research Service. Springfield, Va.: National Technical Information Service, 1972.

Halperin, Morton H. Defense Strategies for the Seventies. Boston: Little, Brown and Company, 1971.

The International Institute for Strategic Studies. The Military Balance 1978-1979. Dorking, Great Britain: Adlard & Son, Ltd., Bartholomew Press, 1978.

_____. The Military Balance 1979-1980. Dorking, Great Britain: Adlard & Son, Ltd., Bartholomew Press, 1979.

Johnson, David T. and Barry R. Schneider (eds.). Current Issues in U.S. Defense Policy. New York: Praeger Publishers, 1976.

Kissinger, Henry A. Nuclear Weapons and Foreign Policy. New York: W. W. Norton & Company, Inc., 1969.

Kozlov, Gen. Maj. S. N. Spravochnik Ofitsera [The Officer's Handbook]. Translation: U.S. Air Force, Foreign Technology Division. Dayton, Ohio: 26 October 1971.

Lomov, N. S. (ed.). Scientific-Technical Progress and the Revolution in Military Affairs (A Soviet View). Translation: U.S. Air Force. Washington D.C.: U.S. Government Printing Office, 1974.

Matamis, Theodore C. and Seymour L. Goldberg. Nuclear Tactics, Weapons, and Firepower in the Pentomic Division, Battle Group, and Company. Harrisburg, Pennsylvania: The Military Service Publishing Company, 1958.

Merriam, G. C. & Co. Webster's Seventh New Collegiate Dictionary. New York: G. & C. Merriam & Company, 1963.

Record, Jeffrey. U.S. Nuclear Weapons in Europe: Issues and Alternatives. Washington D.C.: The Brookings Institution, 1974.

Savkin, V. Ye. The Basic Principles of Operational Art and Tactics (A Soviet View). Translation: U.S. Air Force. Washington D.C.: U.S. Government Printing Office, 1974.

Sidorenko, A. A. The Offensive (A Soviet View). Translated and published by the U.S. Air Force, Soviet Military Thought Series, No. 1. Washington D.C.: U.S. Government Printing Office, 1970.

Sokolovskiy, V. D. Soviet Military Strategy. New York: Crane, Russak & Company, Inc., 1968.

Van Cleave, William R. and S. T. Cohen. Tactical Nuclear Weapons: An Examination of the Issues. New York: Crane, Russak & Company, Inc., 1978.

Articles and Periodicals

Berry, F. Clifton, Jr. "Pershing II First Step in NATO Theatre Nuclear Force Modernization?" International Defense Review, Vol. 12, No. 8 (1979), pp. 1303-1308.

Brodie, Bernard. "The Development of Nuclear Strategy," International Security, Vol. 2, No. 4 (Spring 1978), pp. 65-83.

Calleo, David P. "The European Coalition In A Fragmenting World," International Issues and Perspectives (1979), pp. 84-98.

Ellis, Major Ronan I. "Beyond Deterrence, A Rational Approach to the Deployment of Tactical Nuclear Weapons in Europe," Field Artillery Journal (November-December 1974), pp. 28-35.

Erikson, John. "Soviet Military Capabilities in Europe," Journal of the Royal United Services Institute for Defense Studies, Vol. 120, No. 1 (March 1975), pp. 65-69.

Galen, Justin. "Tactical Nuclear Balance, Part One: Recent Force Trends and Improvements," Armed Forces Journal International (December 1977), pp. 30-34.

_____. "Theater Nuclear Balance, Part Two: The NATO/Warsaw Pact Imbalance," Armed Forces Journal International (January 1978), pp. 20-25.

_____. "Flaws in I.I.S.S. Military Balance Cause Major Problems for NATO," Armed Forces Journal International (December 1979), pp. 28+.

_____. "Can NATO Meet Its Toughest Test? Strategic and Theater Nuclear Forces for the 1980s," Armed Forces Journal International (November 1979), pp. 49-56+.

_____. "NATO's Theater Nuclear Dilemma: A New Set of Crucial Choices," Armed Forces Journal International (January 1979), pp. 16-23.

_____. "The SALT Decade: Accepting Soviet Strategic Superiority," Armed Forces Journal International (May 1979), pp. 19-38.

Kozicharov, Eugene. "Theater Nuclear Forces Approved by NATO," Aviation Week and Space Technology (17 December 1979), pp. 14-15.

Marriott, John. "Tactical Nuclear Weapons," Army Quarterly and Defense Journal (April 1978), pp. 142-148.

Miettinam, Jorma K. "Enhanced Radiation Warfare," Bulletin of the Atomic Scientists (September 1977), pp. 32-37.

Milton, Gen. T. R. "Tac Nukes and Deterrence," Air Force Magazine (August 1976), p. 25.

Milovidov, Gen. Maj. A. S. (ed.). "The Philosophical Heritage of V. I. Lenin and Problems of Contemporary War (A Soviet View)." Translation: U.S. Air Force. Washington D.C.: U.S. Government Printing Office, 1974.

"The Role of U.S. Theater Nuclear Forces In National Defense," Commander's Digest, Vol. 19, No. 14 (1 July 1976), pp. 2-8.

Serchak, COL William E. "Artillery Fired Atomic Projectiles--A Field Artilleryman's Viewpoint," Field Artillery Journal (March-April 1980), pp. 7-12.

Strobridge, Truman R. and Bernard C. Nalty. "The Roar of the 8-Incher," National Defense (September-October 1979), pp. 30-32.

Ulsamer, Edgar. "New Critical Defense Needs," Air Force Magazine (February 1979), pp. 26-31.

_____. "World Hegemony Through Military Superiority," Air Force Magazine (March 1979), pp. 40-47.

Official Documents

Air Force Manual 2-3, Tactical Air Operations--Employment of Nuclear Weapons. Washington: Department of the Air Force, 6 March 1968.

Brown, Harold. Secretary of Defense. Department of Defense Annual Report Fiscal Year 1980. Washington D.C.: U.S. Government Printing Office, 25 January 1979.

Congressional Research Service, Library of Congress. Authority to Order the Use of Nuclear Weapons (United States, United Kingdom, France, Soviet Union, People's Republic of China). Washington D.C.: U.S. Government Printing Office, 1975.

Congressional Research Service, Library of Congress. "U.S. Security Issues in Europe: Burden Sharing and Offset, MBFR and Nuclear Weapons." Washington D.C.: U.S. Government Printing Office, 1973.

Department of the Army Field Manual 6-20, Fire Support in Combined Arms Operations. Washington D.C.: Department of the Army, 30 September 1977.

Department of the Army Field Manual 100-5, Operations. Washington D.C.: Department of the Army, 1 July 1976, Change 1, 29 April 1977.

Department of the Army Field Manual 101-31-1, Staff Officer's Field Manual, Nuclear Weapons Employment Doctrine and Procedures. Washington D.C.: Department of the Army, 21 March 1977, Change 1, 21 November 1977.

Department of Command, United States Army Command and General Staff College. Soviet Commander's Tactical Planning Worksheet. Ft. Leavenworth, Kansas: July 1979.

The Organization of the Joint Chiefs of Staff. United States Military Posture For FY 1980. A Supplement to the Chairman's Overview. Washington D.C.: U.S. Government Printing Office, 1979.

Strategic Studies Institute, U.S. Army War College. "Criteria for Tactical Nuclear Warfare Employment Decisions (U)." Final Report, Vol. II. Carlisle Barracks, Pennsylvania: U.S. Army War College, 15 October 1978. SECRET.

United States Army Command and General Staff College. Organization for Combat--G3 Worksheet. Ft. Leavenworth, Kansas: 20 June 1969.

United States Army Command and General Staff College, Reference Book 101-31, Tactical Nuclear Operations. Ft. Leavenworth, Kansas: January 1980.

United States Department of Defense. Report of the Secretary of Defense James R. Schlesinger to the Congress on the FY 1975 Defense Budget and FY 1975-1979 Defense Program. Washington D.C.: U.S. Government Printing Office, 1974.

Unpublished Material

The BDM Corporation. "Concept for Theater Integrated Nuclear/Nonnuclear Operations (Final Draft)." Report prepared for the Defense Nuclear Agency, 30 October 1979.

Headquarters, Training and Doctrine Command/United States Army Field Artillery School. "Operational Concept for the Tactical Employment of Nuclear Weapons on the Integrated Nuclear/Non-Nuclear Battlefield (Final Draft)." 16 July 1979.

JAYCOR. "Omnibus for Integrated Nuclear-Nonnuclear Operations." Report prepared for the Defense Nuclear Agency, November 1979.

McWhirter, LTC J. H., Jr. "Tactical Nuclear Planning Considerations--Recent Perspectives." Unpublished MMAS Thesis, USA Command and General Staff College. Ft. Leavenworth, Ks, 1976.

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statement be established which is explicit, direct and above all, one which reflects the national will.

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